SP. Ishwariya
Anna University,
Chennai

R.Sathya
Avinashilingam University,
Coimbatore

PTF
Achievement
Award

D. Karpagam
Institute of Printing Technology,
Chennai

A. Gino
SIGA Polytechnic College,
Chennai

PTF Achievement Award *presented to*
the **Toppers of the Printing Students** (2018)

Award & Event Sponsored by

Multivista Global Private Limited

held on 10th December 2018 at

Hall of Guines' 68, Anna University, Guindy, Chennai.

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From President's Desk

Dear Members,

We all feel a sense of satisfaction for coming together to celebrate the 38th year Founding Day in a fitting manner, with over 90 attendees. A third of the audience comprised people from the industry and the remaining, students from Department of Printing Technology-CEG, IPT, Avinashilingam University, and SIGA. It was gratifying on two counts. First, to see all the first rank holders of the above institutions to receive the PTF Achievement award of Rs. 5000/- each instituted by M/s Multivista Global Pvt Ltd., and the Certificates sponsored by M/s PM Digital. The next was to listen to the presentation on 'G7- One Calibration Methodology for Any Process & Any Substrate', by none other than our very own EC member, Mr. K Panthala Selvan.

We are aware that behind every person's success there is a family and the friends that he keeps. Similarly, behind every student's success there is an industry and teacher who would have honed their skills. Events like these go a long in motivating and encouraging the young minds to pursue greater purposes in life.

This issue of Forum Journal contains a lot of useful information on subjects that are thought to have been read but, factually speaking, forgotten – forgotten because of the increasing applicability of software and our dependence on it. However, to achieve a certain level of perfection, we need to fall back on the basics that were taught to us. For posterity and for those members who could not make it to the Founding Day, a small write-up has been presented on the day's events. A special mention is to be made on the efforts taken by Mr. P.N. Naganathan to compile and source material for the Forum Journal.

At this hour, it is time for us to remember the contributions made to the printing fraternity by the ever-smiling, cheerful, one of the earliest Life members of the Forum and the Founder Editor of Print & Publishing Journal, Mr S.K.Khurana. He will be missed for a long time to come. Let us pray for his soul's peace.

Warm Regards,

Your's Truly,

Dr. B. Kumar

In this issue

THE PRINTING TECHNOLOGISTS FORUM

Founding Day Celebrations

Estd. 1981

THE PRINTING TECHNOLOGISTS FORUM
Founding Day Celebrations
held on 10th December 2018

THE 38th **Founding Day Celebration** of the Printing Technologists Forum was celebrated on December 10 and began with a warm welcome address by the Honorary Secretary of the Forum, **Mr. J. Vijayabaskar**. He invited the Chief Guest **Mr. R Jayaraman**, *Director*, **M/s Multivista Pvt. Ltd.**, the office bearers and the speaker of the day, **Mr. K Panthala Selvan**, to the dais.

The Vice President **Mr. M. Venkatesan** expressed his gratitude to **Mr. R. Jayaraman** for sponsoring the event and also the cash award for the past 3 years consecutively to honour the toppers of the printing students. **Dr. Kumar**, the President, expressed that he is privileged to preside over this grand event which encourages budding printing technologists and also thanked **Mr. R Jayaraman** for supporting the event financially for the 4th consecutive year. He said just as a person's worth is determined by his family and the friends he keeps, the students' self-esteem and motivation doubles from the recognition they get from the industries and the teachers. He invited the Chief Guest **Mr. R Jayaraman**,who was also the past President of the Forum, to speak.

Mr. R Jayaraman stated that he was proud to be associated with the Forum and said that he started his career in 1973 by owning a letterpress machine with a small investment of Rs. 25,000/-. He emphasized that machine alone is of no help, what is important is the man behind the machine. Hard work is what defines success in education and beyond. He emphasized the need for people to work hard for the development of our industry which is transforming with the latest technology. He encouraged everyone to draw inspiration from **Mr. P Chellappan**, MD, PM Digital,who always tries new concepts to grow faster. He motivated students to study well and be aware of the world around.

Mr. D Ramalingam, mentor of the Forum, was invited to present the Topper's Award to **Ms. S.P. Ishwariya**, B.E. Anna University – Chennai, **Ms. R. Sathya**, B.E. Avinashilingam University-Coimbatore, **Ms. D Karpagam**, D.P.T. – Institute of Printing Technology – Chennai and finally **Mr. A. Gino**. D.P.T., SIGA Polytechnic College, Chennai.

Mr. A. Karmegam, Past President of the Salem District Offset Printers Association, spoke about the first printed book titled "**New Testament**" in erstwhile Thamizh language MalabarTamil, translated by Bartholomeaus Ziegenbalg, reprinted again with the great effort of **Mr. Rm Senthilnathan** at Dot Line Data. A copy of the Book was handed over to the Anna University H.O.D. of Printing Technology, **Prof. Dr. B Kumar**.

This was followed by a special lecture on G7 by **Mr. K Panthala Selvan**. As he wanted to deliver a lecture in the Forum for a long time, he was doubly happy as his dream came true on the Founding day with the specific topic of G7. He mentioned that he reaches out to offset printers to train them to deliver the best quality printing to their clients. His goal is indeed laudable. During his lecture he mentioned that the G7 method was developed by IDEAlliance (International Digital Enterprise Alliance, General Requirements

A view of enthusiastic gathering.

for Applications in Commercial Offset printers) in 2006. It was created to solve the problem of computer to plate (CtP) printing systems and allied devices for printing images with different tonal value increase (TVIs), or dot gain. Also, professionals in the printing industry follow the International Organization for Standardization's ISO 12647-2, which does not specify colorimetric values for gray balance and refers to multiple TVI curves. This results in an ambiguous definition of the print's final 'appearance'.

The G7 method solves this problem by creating Neutral Print Density Curves (NPDC) that relates to neutral density of the half-tone dot percentages of a print image rather than a TVI curve relating to the input dot percentage to output dot gain.

Using the G7 method for printing is a manual calibration process and is device independent, meaning it can be used for any printing device that allows manipulation of the raster image processor or computer to plate curve information that dictates how digital signals from an image are printed with ink.

However, since the G7 method relies mostly on gray balance, if the image does not contain much gray information, the calibration can be inaccurate. Also, using any uncalibrated offset printing machine it may be difficult to obtain gray balance because it involves "wet-trapping" which can lead to unpredictable values for dark tones. However, G7 is not a standard, it is only a process.

The speech was concluded by presenting mementos to **Mr. V Pasupathi**, *Manager*, Multivista, and to **Mr. K Panthala Selva**n by **Mr. P Chellappan**. The celebration concluded with the vote of thanks by **Mr. G Srinivasan**, COO, Manali Carton Industries followed by dinner.. ∎

Viewing Conditions - for Printing Technology and Photography – ISO 3664-2009

PAPER
(Pressman Academy for Print Education & Resources)

K.Panthala Selvan,
GMI / UGRA / G7 Certified Expert for Print Standardisation

Pressman Academy is Chennai based Print Consultancy with service centre in Mumbai.

PAPER is popular for Press Calibration, Pressroom Standardization, Designing workflow, Implementing QC Process, conducting seminars, conducting onsite teaching sessions for operators etc. Pressman Academy also maintains technical whatsapp group named Print Quality Techniques. To join send request to:

pressmansolutions@gmail.com or whatsapp to 9962247365

Industry Standard Viewing Conditions

THE graphic arts/photographic industries have established a lighting and viewing standard for critical color evaluation and communication between the advertising agency, photographer, service bureau, digital imaging studio, color printer, print buyer, and anyone else in the color reproduction "network". The Standard, ISO 3664:2009, is entitled "Viewing Conditions - Graphic Technology and Photography". This international technical Standard does not specify any lamp, viewer, or fixture. The Standard specifies a precise quality of illumination and specific viewing conditions on the copy being evaluated (at the surface of viewing). Essentially, the Standard specifies five elements: light quality, light intensity, light evenness, illuminating/viewing geometry, and environmental conditions. In short, the Standard specifies a total lighting/viewing environment.

Common light sources we know,

D65 (6500K) - A light bluish colored light source used in color matching applications of paints, plastics, textiles, inks, automotive, and other manufactured products. It accentuates blue and subdues green and red. D65 is commonly used as a primary light source in color measurement instrumentation. It is the specified daylight source for ASTM D1729- 2016, and SAE J361 for automotive applications.

D50 (5000K) - A near white light source used for visual evaluation in printing, packaging, photographic, and other graphic art industries. It is the specified source in ISO 3664:2009. It has similar amounts of red, green, and blue energy. It neither accentuates nor subdues color, a prime requirement when viewing press sheets and original images (i.e., photographs) since they usually have many colors within the product to be evaluated.

LED - As more retail, office, and home environments switch to LED lighting it is becoming increasingly necessary to evaluate color in LED viewing conditions. The increased use of LED lamps is primarily being driven by the fact that they use less energy than other light sources. It should be noted that LED lamp technology is still rapidly advancing. As a result, it is difficult to ensure consistency of color temperature from lamp-to-lamp, batch-to-batch, and manufacturer- to-manufacturer. There is no official LED lighting standard for color matching. LED lamps are best utilized as an optional light source to

gauge how the product may appear in an environment illuminated by a similar LED source.

ISO 3664:2009 Viewing Conditions

1. **Color Quality**: D50 light, which represents natural daylight, is used to maintain compliance with the standard. Use only ISO 3664:2009 compliant lamps.

2. **Light Intensity**: Color decisions should be under light that is between 1750 and 2250 lux, with 2000 lux being optimum.

3. **Evenness**: Evenness is ensured by measuring illuminance at several evenly distributed points on the viewing surface. Illumination should be at least 1200 lux (60% of 2000) intensity at all points on the viewing surface.

4. **Surround**: ISO 3664:2009 specifies that the surround and backing shall be neutral and matte. Munsell N8/ neutral gray paint is used by GTI Graphic Technology, Inc.

5. **Geometry**: The light source, image, and the observer's eyes need to be positioned to minimize glare. The standard does not specify lighting geometry, but states it should be minimized.

What light sources should I use for color matching?

This depends on your application needs. Generally, if the industry you are working in, or the company itself, has a standard practice, that should be followed. The standard ASTM D1729-96 is a good starting point. If this is not available or you are developing your own procedures, determining which light sources to use can be very logical. Other times, it takes a bit of digging to determine which is the best source to use.

For most applications, a Daylight source (D50, D65, or D75) is used as the Primary source for color matching, since Daylight is a big part of our lives. Daylight sources generally have higher amounts of Blue energy. D50 (or "Equal Energy Daylight") is used almost exclusively for graphic arts and photographic color matching applications. D65 (Average North Sky Daylight) is now the most common daylight source for all other applications, such as paints, plastics, textiles, and food. D75 (Noontime North Sky Daylight) was the preferred Daylight source up to 10 years ago, when it changed to D65 to correspond to the source most commonly found in color measurement instruments, D65. Some applications still require the use of D75.

The next most logical source is Incandescent. Since most people have this type of light source in their homes, it becomes a logical Secondary source. CIE has defined a standard Incandescent source, Illuminant A. It's color temperature is characterized as 2856K. Incandescent sources generally have higher amounts of Red and Yellow energy. The Incandescent "Home Light" source used in color matching booths is Illuminant A.

Old color matching booths only had two light sources, one with high amounts of Red/Yellow energy and one with high amounts of Blue energy. If samples matched under these sources, they should match across the spectrum. With the development of fluorescent light sources, additional lamps could be added to aid in the color matching process, and increase confidence in the match.

The third logical source would then be one that emits higher amounts of Green energy. Cool White Fluorescent is such a source. Additionally, Cool White Fluorescent is found in many businesses and retail stores throughout the world. It has become the third commonly found light source. Cool White Fluorescent has a color temperature of approximately 4100K.

Additional light sources can also be used to meet the requirements of an application. For packaging and printed display applications, which are both Point of Purchase (store) and printing applications, the use of a D65 and a D50 source would be recommended. In some large retail establishments, the Ultralume 30 fluorescent lamp is common. This lamp has a color temperature of approximately 3000K, but less energy is needed to power it

than Cool White Fluorescent. For large retail chains (which also have large electric bills when you add up all of the stores) the cost savings can run into the millions of dollars. Because it is used to light the store, the Ultralume 30 lamp might be a good choice as the fourth source to match under. Some companies require it to be the first or Primary source to use for color matching! Again, this is very logical since customers will be viewing the products they may purchase under that lamp. Another popular fluorescent lamp for store applications is the TL84 lamp. It also produces large quantities of light for less cost.

There are a host of other lamps available. Examples are Warm White Fluorescent or WWF (3000K), TL83 (3000K), TL835 (3500K) and many more. The ones listed here are the most commonly found lamps.

Why can two colors match under one light source but not match under a different light source?

This is a common color-matching problem and it is caused by Metamerism. Because colors can be created by using different mixtures of pigments and dyes, the combination of dyes or pigments used will determine how well colors match under different light sources. The greatest effect of metamerism can be seen when viewing a sample under a predominantly Blue source (e.g., D65) and a predominantly Red/Yellow source (e.g., Illuminant A). If the same dyes are used, no metamerism should be seen. If different dyes are used to create the same color, metamerism is possible. When comparing different samples, one colored using dyes and one colored using pigments (evaluating a textile sample next to a paint sample for instance), metamerism is not uncommon. Finding the right "mix" of dyes and pigments is part of the color technologists job. Sometimes, metamerism cannot be eliminated completely, only reduced.

Why do colors look differently under different light sources?

Most all samples will appear differently under light sources having different color characteristics. A Blue source will accentuate blue colors and subdue reds and greens. A Red source will accentuate red colors, etc. This is called Inconstance. Two samples can match under different light sources but both still shift in color. Inconstance cannot be eliminated, only reduced using the proper mixture of dyes or pigments. It is very important to know it exists and observe its effect on the color of the sample to see if the inconstancy is overly objectionable. Keep in mind that a determining factor in color is the light source. If the source does not have Red energy, there will be no Red energy for the object to reflect and therefore will not appear Red.

Are color viewing booths built to some national or international standard?

Yes. Color viewing booths, used for color matching applications, should conform to ASTM D1729-96 (Society for Testing and Materials, an International orgainzation). This standard specifies the surround color of the booth, the light sources to be used, with their minimum color characteristics required, the light levels that are required on the viewing surface, and procedures. The daylight source, as specified by this standard, must have at least a CIE Publication 51 rating of B/C for critical color matching applications. For information on ASTM and the D1729-96 standard, please go to the ASTM web site, http://www.astm.org.

What does the CIE rating mean?

The C.I.E. (International Commission on Illumination) Publication 51 describes a standardized method to assess daylight simulator quality for colorimetry and color matching. The latest update from 1999 provides a rating system for the daylight simulators. The system is divided into two parts. The first indicates the quality of the source in the visible spectrum (400-700nm). The second indicates the source's quality in the UV spectrum (300-400nm). An A/A rating is the best and an E/E rating is the worst. A rating of "B" in the visible spectrum will give between a 0.25 and 0.50 CIELAB Delta

E visible difference, better than most people can observe. ASTM D1729-96, the standard for visual appraisal of colors and color differences, requires a rating of B/C for critical color differences and appraisal applications.

For information on the CIE and Publication 51, please see the CIE web site,http://www.cie.co.at/cie/.

What is CRI?

CRI is the abbreviation for "Color Rendering Index." It is a method of rating how well colors are rendered by a light source when compared to a theoretically perfect source. A CRI of 100 means it will render colors very well. A CRI of 23 means it will not. For color assessment applications, a minimum CRI of 90 is required. This rating system is becoming replaced by the rating system described in CIE Publication 51.

Why isn't the Color Rendering Index a good method of determining a light source's ability to reproduce color well?

When it was first developed, CRI was the best method to rate a light source's ability to render color. Unfortunately, for non-continuous spectrum light sources, such as fluorescent lamps, the method does not accurately rate the source's color rendering abilities. In fact, a high CRI can be produced by using three narrow spectrum lamps, one Blue, one Green and one Red. Because of this, the more stringent CIE publication 51 method was

developed. GTI ColorMatcher® and Graphiclite® lamps achieve a Publication 51 rating of B/C, the rating required for critical color matching applications.

What does D50, D65, and D75 mean for daylight sources?

The "D" indicates it is a daylight simulator. The numerical value indicates the color temperature of the lamp (5000K for D50, 6500K for D65, and 7500K for D75).

What daylight source should I use – D50, D65, or D75?

It depends on your application. D50 is used in the graphic arts and photographic industries for color assessment of imaging media. D65 is used for color matching applications in the inks, paints, plastics, and textiles/

apparel industries. D75 is the old daylight source for these applications but is still used for some specialty applications (color vision testing for example). Most applications are now either D50 or D65. GTI Graphic Technology, Inc. offers lamps in each of these color temperatures, in an assortment of sizes.

Can people use light boxes from different manufacturers to compare samples and still get good results?

Yes, providing each booth meets the specifications of ASTM D1729-96, has the same surround color (i.e., Munsell N7) and has a CIE Publication 51 rating of B/C or better.

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Student's Knowledge
Base & Resource

AdobePS Printer Driver

If you are printing to a PostScript printer or creating PostScript print files (perhaps for Adobe Acrobat Distiller), the AdobePS printer driver replaces your standard Mac or Windows printer driver and offers several improvements. Installation of this driver requires a PostScript Printer Description (PPD) file for your printer, which allows the driver to control all of your printer's features, such as optional paper trays, enhanced imaging modes, and duplex (two-sided) printing. More instructions are included in the Read Me file that comes with the AdobePS software.

To download the latest AdobePS printer driver for the Macintosh, point your browser to http://www.adobe.com/support/downloads/pdrvmac.htm

To download the latest AdobePS printer driver for Windows, point your browser to http://www.adobe.com/support/downloads/pdrvwin.htm

Note: *Mac OS X, Windows Vista, Windows XP and Windows 2000 include a native PostScript printer driver that supports OpenType CFF fonts.*

OpenType & Font Management Utilities

Because OpenType CFF fonts are a newer format, you need to check that the version of the font management application you are using supports them. If you are using ATM Deluxe to manage your fonts, version 4.1 or higher for Windows and version 4.6 or higher for Macintosh support the activation and management of OpenType fonts. Note that font managers on Mac OS X can only activate fonts for carbon and cocoa applications (not Classic applications).

For further instructions on how to install OpenType fonts with ATM Deluxe or any other font management application, please refer to your font management application's documentation.

Adobe Type Manager (ATM) Light

Adobe® Type Manager® (ATM®) Light is a system software component that automatically generates high-quality screen font bitmaps from PostScript® Type 1 or OpenType CFF outline font data. With ATM, you can use Type 1 and OpenType fonts at any size, and you can also enable "font smoothing," (anti-aliasing) which further improves the appearance of your fonts on-screen. ATM Light also allows you to print your PostScript Type 1 or OpenType CFF fonts to both PostScript and non PostScript printers.

Note: *Windows 2000, Windows XP and Windows Vista do not require ATM Light. Windows Vista is not compatible with ATM Light or Deluxe. Mac OS X only needs ATM Light to provide support for "Classic" applications, not for Carbon or native applications.*

To download ATM Light, go to: http://www.adobe.com/products/atmlight/main.html. If using AdobePS 8.8 or later, you should also update ATM to 4.6.1a/4.6.2a. The update is available at: http://www.adobe.com/support/downloads

Note: *Adobe recommends that once you install ATM Light, you increase the utility's character cache setting (the amount of memory allocated for storing font information and drawing it to your computer screen) to at least 512K in Windows 98/ME (newer versions of Windows do not have a character cache setting), and to at least 1MB in the Macintosh version. To increase this setting in the Win-*
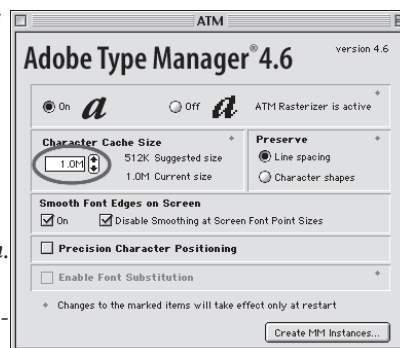
Advanced OpenType Features

Characters and Glyphs

The distinction between characters and glyphs is central to a discussion of advanced OpenType layout feature support. *Characters* are the code points assigned by the Unicode standard, which represent the smallest semantic units of language, such as letters. *Glyphs* are the specific forms or shapes that those characters can take in a font.

A key point is that one character may be represented by any of several different glyphs. For example, lowercase 'a," small cap "a" and an alternate swash lowercase "a" are all the same character—namely the lowercase "a"—but they are three separate glyphs.

Additionally, although the relationship between glyphs and characters is often one-to-one, it may be many-to-one, one-to-many, or many-to-many. For example, sometimes several characters may be represented by one glyph, as in the case of the "ffi" ligature, which corresponds to a sequence of three characters: f, f and i. Alternately, one character may be represented by several glyphs. For example, "é" is often considered a single character, but might be assembled on the fly from separate glyphs for the base character and the accent.

OpenType layout features can be used to position or substitute glyphs. For any character, there is a default glyph and positioning behavior. Applying layout features to one or more characters may change that default positioning or substitute a different glyph. For example, the application of the "small capitals" feature to the "a" would substitute the small cap "A" glyph for the usual lowercase "a" glyph.

OpenType layout features

To access alternate glyphs or apply alternate positioning with an OpenType font, an application must understand OpenType layout features and present a user interface that allows end users to select and apply different layout features to text.

<div style="border:1px solid; background:#cce6f4; padding:10px; text-align:center;">

will be continued in the next issue...
Excerpts from
OpenType® User Guide for **Adobe® Fonts**
Source-courtesy: **Adobe.**

</div>

OpenType and Adobe Applications

Current and recent versions of InDesign, Illustrator and Photoshop all provide OpenType layout feature support (see pages 10-13 for feature descriptions, and p. 14 for features by application and application version). With these OpenType savvy applications, you can turn on OpenType layout features that automatically substitute alternate glyphs in an OpenType font, such as automatic ligatures, small capitals and proportional oldstyle figures.

This support simplifies the use of professional typographic features once considered cumbersome, and providing exciting new typographic capabilities.

Those layout features that have some effect even on non OpenType fonts (such as all caps, small caps, and ligatures) are on the main flyout from the InDesign character palette. However most OpenType layout features are accessed either by the OpenType sub-menu of the character palette flyout (for InDesign) or from the OpenType Palette (for Illustrator CS, CS2 and CS3). The many OpenType formatting options are discussed in detail below.

To gain a better understanding of the features supported in each OpenType font, in InDesign or Illustrator CS/CS2/CS3 you can use the Glyph Palette to view the glyphs available for each feature (see section below). *Remember that not all fonts have all OpenType layout features, and that some features may work only on certain characters.*

There are three features which may have an effect on non-OpenType fonts, but do more with OpenType fonts that have relevant layout features. These features—ligatures (which are on by default), all capitals, and small capitals—are directly accessible from the main flyout of the InDesign character palette.

In InDesign 2.0, these typographic features were included on the main pop-up menu because they can sometimes be used with non-OpenType fonts. See the individual feature descriptions for details.

Note: In Adobe applications, selecting the Superscript and Subscript options on the Character palette's main flyout will create these glyphs by scaling full-size numbers, even if the selected font contains designed superscript/subscript glyphs. To access designed glyphs contained in an OpenType font, you should instead use the "Superscript/Superior" and "Subscript/Inferior" features on the OpenType flyout menu or palette. See the *OpenType layout features glossary* below for details.

7 Beginner Mistakes to Avoid When Designing for Print

Designing for print can be a minefield for beginners. There's so many easy mistakes to make that can have a serious impact on the quality of your final prints. With print runs also being very expensive, these mistakes can prove very costly. Hopefully today's discussion about common beginner mistakes to avoid will help prepare you with the crucial knowledge required to correctly set up a design for print.

Know the difference between RGB & CMYK.

The most obvious mistake that newcomers fall victim to is the misuse of RGB and CMYK colour modes. RGB (red, green & blue) is an additive colour system where light is used to mix colours; the more light you add the brighter and more vibrant the colour gets. When working on digital designs you'll often be working in RGB mode because that's how your monitor works, but the problem arises when we're creating a design for print using a RGB based tool.

CMYK (cyan, magenta, yellow & black (key)) is a subtractive colour system where inks are mixed to create a range of different hues, much like mixing paint as a traditional artist. The more ink you mix the darker the colour gets. The spectrum of colours that can be produced by light is much wider than the range achievable by ink, so our design applications have a special CMYK mode to limit the "gamut" of the colours we have available when creating a design that will ultimately be printed.

Failing to select the CMYK colour mode and instead creating your designs in RGB may result in you selecting awesome colours that just can't be reproduced in print (without special inks). If you don't realise this early on you're going to be in for a surprise when your prints come back all dull and muted.

Watch your CMYK color values
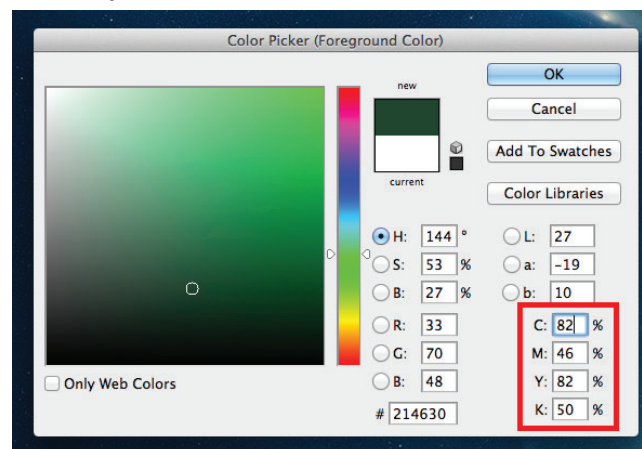
We've already talked about how the typical CMYK color model gets darker as you add more ink. In the printing process this is done using an offset lithographic printing press (or a digital printer for small runs). This machine lays down a coverage of the four inks of cyan, magenta, yellow and black over the same area of paper to overlay the inks and create a much wider range of colours. Tiny halftone screens determine how much ink from each plate is applied across the print.

In our design applications we can easily select colours using the color picker tool as well as ready made swatches and adjustable sliders for the C, M, Y & K values. You must keep in mind that colours that use large amounts of cyan, magenta, yellow and black will quickly become oversaturated and any total values containing over 280% coverage may result in ugly muddy colours and set-off (when the ink remains wet and transfers from one sheet to another). Our computer applications might show the colour looking fine on screen, but in reality prints always appear darker than your original design.

Using mixtures of multiple inks will also result in potential fuzziness, especially when applied to fine artwork such as text. If those four C, M, Y & K plates are just slightly misaligned (known as registration), your text will appear blurry and difficult to read. Perfectly sharp text can be created by using just one process colour value, so 100% K (black) will be as crisp as you can possibly get.

Don't use Photoshop black
(See fig. in next column))

Open Photoshop and hit the D key to reset the foreground and background colours to their default values. Select the black that has been generated for you, it looks… black, right? Now look at the CMYK values that colours is made from, you'll find 75% cyan, 68% magenta, 67% yellow and 90% black (300% total coverage). This is a lot of ink to put down on paper. Always manually set your black appropriately. This could be 0,0,0,100 for that crisp black for text, however this doesn't look great when used as a background colour with it looking more like a dark grey than black. Instead you might opt for a "rich black", of which there's many recommendations, but 50,40,40,100
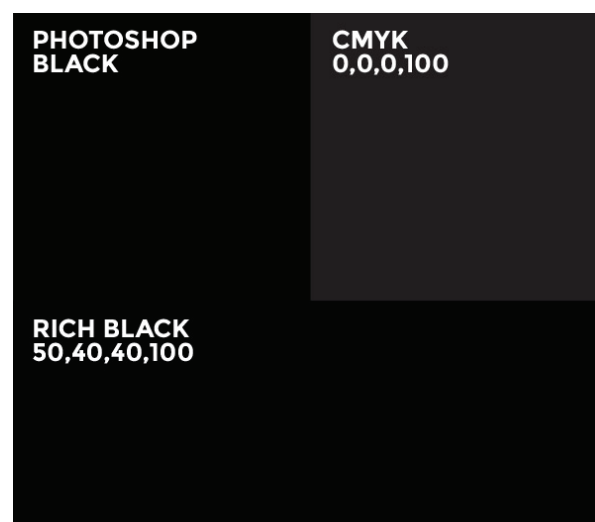
is a popular choice. This addition of other colours darkens the black to provide a much deeper colour, but it's still well within the coverage limit.

Don't forget the bleed

Resolution isn't the only crucial factor when setting up a print design layout. You'll also need to remember to accommodate for bleed. Bleed is an extra margin around the edge of your design where any background elements that touch the edge of the page are extended slightly. This allows for slight inaccuracies when the printed sheet is trimmed to size, so cutting through that buffer of colour will avoid leaving any thin white strips of paper along the edge of your print.

The actual amount of bleed you require will differ between print supplier and project, so be sure to select a printer beforehand and acquire their specs.

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Excerpts will be continued in the next issue...
Source-courtesy:
from the blog
blog.spoongraphics.co.uk

The Technology of 3D printing for prosperous packaging – beyond prototyping

Article by
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3D Printing is a digital manufacturing technology that engages a range of processes and applications, with a common premise of additive technology. The Additive technology is the process of making 3 Dimensional solid objects that builds the parts up, usually layer-upon-layer either by Photopolymerisation, material Jetting, Fused Deposition (FDM) or with Laser Sintering (SLS) technology. 3D Printing enables to produce complex (functional shapes using less material than traditional manufacturing methods. This additive approach ultimately enables manufacturers to eliminate the need for tooling.

3D printing has already had a big impact on the packaging industry. The possibilities of 3D printing have expanded in the packaging industry in last few years beyond prototyping. There has been a lot of interest and research in 3D printing that elevated the packaging industry to the next level. This article is to encapsulate the aspects of 3D printing in packaging, from prototyping to customised finished products.

3D technology and Packaging industry development

3D printing has historically been an interesting niche technology capable of producing incredible things. The industry is diverse, offering a huge range of technologies, the technological convergence ultimately being used as a means of manufacturing end use products, including ground-breaking primary and secondary packaging, at high volumes.

In contract packaging, innovation is the name of the game. An organization's ability to find new and better ways to improve their process is crucial to success. 3D printing technology has allowed many organizations to transform the way they operate. It provides another level of design and development capabilities. 3D printing has applications across almost any industry, including: bio-tech, engineering, manufacturing, robotics and even education. Availability of 3D printing has grown over the past 10 years, making it very easy to implement into any operation. Due to freedom of open source 3D printing software, diversified materials, reduced cost on machines, multiple technologies, have definitely made easy to reduce cost for customers. The application of 3D printing is endless.

3D printed packaging products

At the early stages, 3D printing had certain limited applications in the packaging industry, which included prototyping. However, in recent years, 3D printing has made several strides in its applications, and is expected to continue the momentum. 3D printing is now being increasingly used for the construction of final products. 3D printing is anticipated to create immense opportunity for the growth of the packaging industry, especially during occasions, ranging from corporate events & conferences, to special events with worldwide coverage such

as the Olympics, NBA or FIFA. This arises from the requirement to turn around packaging that relates to that event. 3D printing has equally likely chances of disrupting the packaging industry as nanotechnology. Therefore, the outlook for the growth of the global 3D printed packaging is anticipated to be largely positive.

3D printer allows companies to do, provide real-time innovations to a packaging line at a moment's notice. The time that would be used hiring an outside company to design and fabricate new parts, can now be brought in-house. By doing this, packaging industries adds capabilities and is able to reduce consumer costs.

The Segments of 3D printed packaging market

The global 3D printed packaging market has been segmented as follows –

1. **On the basis of end use packaging industry**
2. **On the basis of 3D printing method**
3. **On the basis of application**

1. **On the basis of end use packaging industry**, the global 3D printed packaging market has been segmented as follows –
   - Food & Beverage packaging
   - Personal care & cosmetic products packaging
   - Medical products & pharmaceutical packaging
   - Others

2. **On the basis of 3D printing method**, the global 3D printed packaging market has been segmented as follows –
   - Additive manufacturing
   - Subtractive manufacturing

Additive manufacturing

It is the process which allows the construction of 3D objects by successively depositing material in layers such that it becomes a predesigned shape.

Subtractive manufacturing

In this method, 3D objects are constructed by successively cutting material away from a solid block of material.

3. **On the basis of application**, the global 3D printed packaging market has been segmented as follows –
   - Concept models
   - Functional prototypes
   - Manufacturing tools
   - End use parts

The Key Players of 3D printed packaging

Some of the key players using 3D printing for packaging are
- The Dial Corp.
- Silgan Plastics
- Xerox Corp.
- Tray-Pak

Some of the brand owners who use 3D printing include
- Estee Lauder
- Coty, Inc.
- L'Oreal S.A.
- GlaxoSmithKline plc
- Mondelez International, Inc.

Some vendors in the market include
- GenPak
- Lombardi Plastic
- Smart Design Co.

Key developments & dynamics of the 3D printed packaging products market

3D printing has had a troubling history of competing with alternative technologies for price. However, one of the key characteristics observed in modern consumers is a large affinity towards packaging designs which are more exciting, engaging, creative and interactive.

3D printing would enable designers and engineers to do just. The possibilities with 3D printing in the packaging industry are limitless, especially with custom-built packaging formats. 3D printing enables a company to add real-time innovations to a packaging line, efficiently.

Rapid Prototyping

3D printing can accelerate early-stage product development through rapid prototyping. It helps companies design several molds so that prototypes can be manufactured quickly and economically. Thus, 3D printing technologies can rapidly expedite the time and cost it takes to bring a product to market.

Using 3D printing to fabricate single parts or a limited number of parts is cheaper than using standard plastic processing techniques like injection molding,

thermoforming and blow molding. With 3D printing, one can go from a CAD blueprint to a complete part in a matter of days or, potentially, *hours.*

The pharmaceutical companies use their 3D printers to construct functional prototypes for their drug packaging (Primary and Secondary).

Revolutionizing Packaging Machinery

3D printing will also impact packaging machinery manufacturers. For example, 3D printing can be used for printing robotic arms used in production. Therefore, 3D printing is anticipated to positively impact packaging machinery manufacturers.

Making spare parts for printing and packaging machinery will be revolutionized as well, by making them on the spot, instead of being supplied all around the globe. Instead of shipping replacement parts, companies will be selling the packaging machine together with a software package for the end user to 3D print out any spare part needed on site at their manufacturing plant.

Custom and Personalized Packaging

With the current and future trend of making everything more custom-made packaging containers, it is not surprising that manufacturing technologies such as 3D printing will be of high importance. The technique allows customers to design and make their own highly customized packages on request. Individual packaging designs can be manufactured specifically in accordance with customer wishes and various design prototypes can be produced efficiently.

The trend of personalized packaging is particularly relevant for the food and beverage industry, where an aid to custom and personalized packaging solutions, personalized gifts such as cakes and drinks are valued.

Reducing Plastic Waste Pollution

3D printing can also help companies make more environmentally friendly packaging. Plastic waste pollution is a huge problem, but with 3D printing, plastic waste can be cleaned, dried, shredded, and extruded into a printable filament that can be recycled into a 3D printer for a new product. As more sustainable bio-plastic materials are used, the adoption of 3D printing in packaging manufacturing may truly help save the environment. Generating less waste is not only environmentally friendly but economical as well.

3D printing is expected to witness growth in the rate of adoption in the next few years, owing to their zero contribution to plastic waste pollution.

The potential to accomplish

To conclude, 3D printing will eventually be routinely used as a means of manufacturing products related to end use. In the recent years, we have witnessed a growing interest for personalized packaging among brands and packaging manufacturers. For instance, Coca-Cola's share a coke campaign, Nutella offering personalized jars of chocolate spread displaying the name of the consumer, Heinz running a competition to win a personalized bottle for HP sauce, for Father's day. These, and the fact that many beverage and alcohol brands are now selling NFC enabled bottles which can be connected with smartphones, emphasize that the trend of personalized packaging is likely to become more popular. Therefore, experimenting with 3D printed packaging would be of great interest for these brands. There are several challenges to be faced down the line. High investment is required for 3D printing equipment, along with skilled operators.

And according to a recent survey, 70 percent of companies surveyed believe that 3D printing will soon be used for obsolete parts and 57 percent believe it will be used for after-market parts. The study also revealed that 66.7 percent of manufacturers are adopting 3D printing in some capacity and that within the next three years, 24.7 percent plan to adopt 3D Printing for some kind of use. Only 9 percent reported they had no plans to use 3D Printing in any way.

A similar survey in 2016 made by Packaging Digest, trying to understand the extent of incorporation of 3D printing in the

packaging industry, summarises that over one-third of respondents were already using 3D printing for product packaging and the others plan to do so in the near future.

"The biggest challenge in packaging is price at volume. 3D printing is likely to have an important place in the area of highly differentiated products or special events. 3D printing can open up new creative possibilities for packaging.

"3D printing won't often be able to compete with other technologies for price, but It will enable designers and products to be more creative in their thinking and make packaging far more engaging, exciting and interactive.

Technologies / Processes of 3D Printing

1. Vat Photo polymerisation
- Stereo Lithography (SLA)
- Digital Light Processing (DLP)
- Continuous Liquid interface Production (CLIP)
2. Material Jetting
3. Binder Jetting
4. Material Extrusion
- Fused Deposition Modeling (FDM)
- Fused Filament Fabrication (FFF)
5. Powder Bed Fusion
- Selective Laser Sintering (SLS)
- Direct Metal Laser Sintering (DMLS)

Abbr.	Name	Technologies
ABS	Acrylonitrile Butadiene Styrene	FDM / FFF
PLA	Poly Lactic Acid	FDM / FFF
Nylon	NYLON	SLS / FDM / FFF
PP	Polypropylene	SLS / FDM / FFF
Resin	3 D Printing Liquid	SLA / DLP
ASA	Production Grade Thermoplastic	FDM / FFF
PC	Poly Carbonate	FDM / FFF
PETG	Poly Ethylene Terepthalte G	FDM / FFF
HIPS	High Impact Poly Styrene	FDM / FFF
PEEK		
TPU / TPE	Thermoplastic Polyurethane	FDM / FFF / SLS
POM	(Acetal) Polyoxymethelene	FDM / FFF
PVA	Poly Vinyl Alcohol	FDM / FFF
ULTEM	Sub Class of Polytheremide	

6. Sheet Lamination

7. Directed Energy Deposition

Which 3D Printing Materials Packaging Industry can Use (*see table*)

3D Printers and Models available in Market
- MakerBot Replicator
- Prusa
- LulzBot TAZ
- MakerGear
- Formlabs
- Ultimaker
- Polymaker
- Finder
- Creative Pro

"3D Printing – "Centre of Excellence"

Don Bosco SIGA, an Indian pioneer Institute of Graphic Arts, Chennai along with Next Generation 3D Printers Pvt. Ltd. Instituted first in kind of "**3D Printing Centre of Excellence**" specialized for Printing and Packaging at SIGA Polytechnic College Chennai.

SIGA – NexGen 3D Printing Centre of Excellence is offering a short-term Skill Development Course in 3D Printing and Certificate Course in 3D Printing Machine operator, Certificate course in 3D Printing Sales and Service.

SIGA – NexGen 3D Printing Centre of Excellence is also ventured into the consultancy in 3D printed packaging solutions and prototyping the packaging products. ∎

An Insight...

Web *to* Print:
The Next Generation

Introduction

As the Internet began to gain steam in the late 1990s, software developers saw an opportunity to make it easier for businesses and consumers to order, and even design, printed materials. Thus, the web-to-print category of Internet software was born, and the field was littered with players during the dot-com boom. Few of those original entrants have survived, but many others have entered the market as the category has continued to evolve.

And the user requirements have also continued to evolve, especially as cloud-based solutions and mobile communications have become ubiquitous and bandwidth is more readily available. Consumers expect an Amazon- or Uber-like experience. They want to be able to do everything from their mobile devices, anytime, anywhere. They want to be able to seamlessly move back and forth between the mobile and desktop environments (if they are even using a desktop or laptop computer, that is!). And they want more robust capabilities – they want to be able to do more than just put their name on a business card.

At the same time, marketers view web to print as a means of providing marketing and other materials to their stakeholders, moving document creation closer to the point of use while still protecting brand integrity with templates that lock down certain portions of the content. It is a way to ensure higher quality of marketing and other materials while reducing overall administrative costs. And purveyors of web-to-print services are looking for the low cost, ease of use and robust functionality that will help them gain and retain customers in a highly competitive business environment.

MARKETERS VIEW WEB TO PRINT AS A MEANS OF PROVIDING MARKETING AND OTHER MATERIALS TO THEIR STAKEHOLDERS.

All of this has led to the next generation of web-to-print solutions entering the market. These are pure-play cloud solutions, developed from the ground up to operate in an open environment and to easily integrate with other applications. This allows developers to focus on their individual areas of expertise and users to leverage other modules to round out the total solution by picking and choosing the components that will make up a workflow that meets their needs with minimal internal software development required.

This white paper lays out the capabilities today's operators should be seeking as they move to Uber-ize their customer-facing applications. It cites the real-world experiences and results being achieved by industry leaders as they implement the next generation of web to print, and provides guidance for those seeking to do the same.

Web to Print: The Next Generation

Hello to Next-Gen Customer Service

The principals at Holland-based Helloprint have been involved with web to print for 15 years. After selling a company, they decided to found a new business. Helloprint was born, and it benefited from the lessons learned in the past. Today, Helloprint is one of the fastest growing ecommerce platforms in the Benelux with more than 130 employees. The company primarily serves small businesses, the SOHO market and does business with the trade. Print is produced through its network of more than 150 suppliers in eight countries.

"We made mistakes in the past and learned from them," said Michael Heerkens, the company's CTO. "Now we had the opportunity to build something from scratch, and that was exciting for us."

Heerkens points out that its customer base is generally not that educated in terms of preparing an accurate print-ready file. "That's why our HTML5-based system needed to automatically preflight every file that comes in," he explained. "Customers can upload any file type, and we automatically convert that to a PDF. When preflight fails, we use our built-in online editor to attempt to fix the file. If we encounter file issues we cannot correct, the customer can come right in and fix the file themselves using our online editor. They can also do a final proof of the PDF, scaling file elements or moving things around until they have a proper file they are satisfied with. This process means we are only manually involved with a file if there is an exception; and we are able to deliver accurate, print-ready files to our suppliers that don't require manual intervention on their part." Although the company is relatively early in the implementation process, it has already increased the number of files that do not need manual intervention by 40%. "This is a huge win for us," Heerkens states. "Every time we touch a file, it costs €40. We process about 3,000 orders per day with an average order size of about €100, so manual touches really eat into the profit margin."

> "WE MADE MISTAKES IN THE PAST AND LEARNED FROM THEM. NOW WE HAD THE OPPORTUNITY TO BUILD SOMETHING FROM SCRATCH, AND THAT WAS EXCITING FOR US."
>
> MICHAEL HEERKENS, CTO

Helloprint has more than 2,000 professionally designed templates that customers can choose from, and offers the ability for the customer to start with a blank canvas as well. The system is also integrated with Adobe's Fotolia, allowing users to choose from millions of online photos as they are creating their designs. Within the system, users can also easily add their logos to promotional products such as T-shirts, pens, USB sticks, power banks and more. 3D viewing capability allows them to view products in 3D to ensure they are happy with the logo placement, make adjustments, proof and approve for production.

While Helloprint has been focused on smaller businesses, the cloud-based system it has developed is robust and scalable enough to support larger enterprises. The company is in the process of increasing the

Web to Print: The Next Generation

range of branded designs it offers larger customers. "These are closed, branded environments," Heerkens said. "Authorized users of these enterprises visit a branded store, modify materials as allowed by the brand owner, and purchase materials without the need for a designer to be involved."
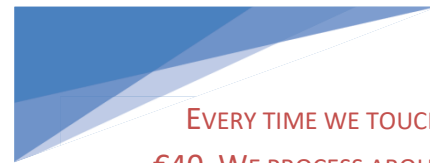
Heerkens points out that for these companies, the previous process required a designer to be involved if any changes were made, along with all kinds of approval processes. "Now that can all be done online, in real time, and significantly reduces the administrative and design time requirements at the enterprise."

One advantage Helloprint – and the other companies we spoke to in researching this white paper – has over its older competitors is that it was able to create a pure play cloud-based clean sheet design that is not dependent on legacy technologies. At the core of the system is an online editing solution that is built on XML and HTML5 with well-documented APIs that make it easy to integrate with other modules. "Building a cloud-based platform like the one Helloprint has implemented on top of a legacy system is not an ideal approach," said Pat McGrew, Director of the Production Workflow Service at research firm InfoTrends and a long-time evangelist for digital workflows in the graphic arts industry. "We have seen many suppliers of legacy (i.e., client/server based) web-to-print and other workflow offerings try to move onto a cloud-based platform, and they are discovering that their legacy platforms, on which they are dependent, are killing them."

> EVERY TIME WE TOUCH A FILE, IT COSTS €40. WE PROCESS ABOUT 3,000 ORDERS PER DAY WITH AN AVERAGE ORDER SIZE OF ABOUT €100, SO MANUAL TOUCHES REALLY EAT INTO THE PROFIT MARGIN."
>
> Michael Heerkens

In the Helloprint implementation, the company assembled a number of cloud-based components around the core online editing solution in order to avoid the legacy pitfall. This also allows them to choose best-in-class modules from a variety of suppliers to build the exact solution they need, rather than being required to use a more closed, turnkey system that might not meet all their needs and might be difficult to integrate.

"Helloprint chose CHILI publisher as its core online editing solution," McGrew added. "As their past experience showed them, the user interface needs to be as easy for a small to mid-sized business to adopt as a larger enterprise. Since CHILI publisher was designed as a component, not a turnkey solution, the folks at CHILI publish have well-documented procedures for integrating with ecommerce platforms such as Magento as well as other components. They can provide guidance on what to do and what not to do that can make the implementation process smoother and the final product better than it might otherwise be. We're in a state of the industry where there are not as many quality players as you would think there might be, in terms of suppliers. So doing a complete evaluation and lots of testing up front, before the buying decision is made, is critical."

Lessons learned by Helloprint include:

Web to Print: The Next Generation

- Start with a clean-sheet design if at all possible.
- Choose an open platform, well-documented online editing solution that can integrate with a robust storefront and other workflow components.
- Make sure the final outcome will yield a platform that is easy to use for inexperienced users but robust enough to meet the needs of more experienced users.
- Ensure the final platform will be as automated as possible, taking touches out of the process and delivering accurate print-ready PDF files.
- Enable a 3D proofing process to make it easier for users to ensure they have specified their designs accurately. This is especially important when dealing with three-dimensional promotional products or products such as labels but can be useful to demonstrate binding, page layout and more.
- Leverage native, cloud-based components to keep costs in line while allowing the ability to scale as the business grows.
- Templates are a must – your web-to-print offering must be able to provide customers with high quality templates, but must also be able to give them the flexibility to create their own designs.
- Transparency is critical. There needs to be a mechanism for customers to easily enter the system, both to edit and/or correct files, anywhere during the process where this is required, and to check status of their order. This self-service model eliminates time and cost and makes it more convenient for both customer and printer.

"SINCE CHILI PUBLISHER WAS DESIGNED AS A COMPONENT, NOT A TURNKEY SOLUTION, THE FOLKS AT CHILI PUBLISH HAVE WELL-DOCUMENTED PROCEDURES FOR INTEGRATING WITH ECOMMERCE PLATFORMS SUCH AS MAGENTO AS WELL AS OTHER COMPONENTS."

Pat McGrew, InfoTrends

This is sage advice for companies that are new to web to print or are looking to upgrade an existing web-to-print platform. ∎

will be continued in the next issue...

Source Courtesy : A White Paper *by* **Cary Sherburne**
Prepared for **CHILI publish** *by* **www.whattheythink.com**

Print Forum

An official Bi-monthly Journal of **The Printing Technologist Forum**

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AWARDS 2018
NAEP - Corrustar - Printweek

Manali Carton Industries
wins Awards

Manali Carton Industries located at Chennai is a Printing & Packaging company. In addition to Print, Finishing and Conversion of value added cartons, they also have multiple Corrugated lines. They cater to a wide range of discerning Customers.

NAEP awards 2018

@ Madurai,

Bagged a total of **Four awards** including **two Gold** and **one Silver** awards apart from **one Merit Certificate**.

Corrustar awards 2018,
@ Chennai

Highest recognition for excellence in corrugation industry by all india body **FEDERATION OF CORRUGATORS BOX MANUFACTURERS OF INDIA**

Categories *"consumer pack"* and *"innovation"* bagged **two First prizes**.

Printweek awards 2018
@ Mumbai

Nominated for '*Innovative printer of the year*'.

These awards are recognition of the high quality packaging made by Manali Carton Industries Team.

They are a "**One-Stop-Shop**" for all print and packaging requirements of Customers.

Print is Alive and Well

Inside the Rathna Offset building, huge machines spew out hot sheets of paper every second. Read on to discover how your book is printed

Heaps of finely shredded strips of paper, the staccato churning of the machines and the heavy scent of wet ink and glue, have by now, become part of the evening. A two-and-a-half hour long tour of Rathna Offset printing press, spanned across two floors of a building on bustling Peters Road, sure gets you used to these sights and scents.

"When they say print is dying, they are talking about the change in the way we consume news," says Nakul Rajkumar, one of the third- generation directors of Rathna Off set Press, "**Printing of products is still very much alive.**" (The newspaper journalist is not very impressed by this piece of information.)

He continues, "Print is easily re- cyclable unlike e-waste. The argument that print is not eco-friendly doesn't hold well." The press which does sheet fed/offset and digital printing houses different sections for different processes. What remains common in all these sections is the unavoidable scent of paper, ink and glue....... (*continues*)

HOW IT WORKS IN OFFSET

The pre-press team treats the content digitally to regulate the colours. The content is then rendered on to a chemically treated aluminium plate. The coating on the plate is partially removed via laser, leaving the image area unprocessed. The aluminium plate is fed on to a cylinder and goes through trails of ink and water. While the oil-based ink is absorbed by the hydrophobic metal areas, the water washes the hydrophilic remains of the plate. This is how the ink stays in place.

The making of books

The well-lit room on the first floor opens to an interesting sight. A bespectacled woman sits amidst a number of neatly stacked piles of paper. Her arms move mechanically, swiftly yanking out paper after paper from each pile, to group them into a bunch. Her undivided concentration doesn't seem to falter despite knowing that 17 odd strangers are curiously observing her actions. "This is called gathering," says Aadithya Sharan, one of the other directors, and Nakul's cousin....... (*continues*)

Two-and-a-half hours and two floors later, the visitors are still not done with the questions. Laughingly, Aadithya says, "I honestly didn't think people would be still interested in the printing business."

The printing press guided tour was organised by Chennai Photo Biennale. For details, visit chennaiphotobiennale.com. ∎

CONDOLENCE

Mr. S.K. KHURANA

Founder Editor,
Print & Publishing Journal and
Life Member of
The Printing Technologists Forum
passed away on 18.11.2018.

May the departed soul rest in peace in the heavenly abode at the feet of his creater.

President and Members of The Printing Technologists Forum express their heartfelt condolence to the family members.

We, the Members... together form The Forum

This is a Members' Page, giving updated information on New or Renewal of Enrolments, Change of Categories, Change of Addresses, New Designation, New Appointments & Promotions, Retirements, New or Additional Telephone, Mobile, Email ID, Weddings, Renewal Details of Membership etc.

Membership Progress

During November - December 2018

New enrolments...

Dr. N.Krishnaswamy 60 TA (5)
Officer Incharge, DGM

Res: "Lotus", P.24, Venkatesa Nagar Main Road, Puzhuthivakkam, Chennai - 91.

Off: Bharatiya Reserve Bank Note Mudran Pvt. Ltd., (A Wholly Owned Subsidiary of Reserve Bank of India), Note Mudran Nagar, Salboni - 721132, West Bengal

Phone: *Mobile:* 94347 22816

R.No.: 3807/27.11.18/Rs.4000

Membership Period from 1.4.17 to 31.3.2022

The Forum's Congratulations to Happy Parents of Newly Wed Couple

Mr. R.K.Sridharan
Engineer (Retd.), The Hindu
Hony. Treasurer of The Forum & Life Member
and
Mrs. Sasikala Sridharan
celebrate the marriage of their daughter

Sow. R.S. Susithra, B.E., M.B.A
Hexaware Technologies Ltd, Chennai

with

Chi. K.B. Ranjith B.Tech
Associate, Cognizant Technology Solotuions Chennai

on Wednesday 28th November 2018
at Kumbakonam

Reception on 2nd December 2018

at Shri Balajee Bhavan, Chrompet, Ch-44.

His large number of friends from printing fraternity and beyond and relatives blessed the young married couple on the occassion.

President and Members of The Printing Technologists Forum wish the young couple a long, happy, healthy and prosperous married life.

Acknowledgement for the Receipt of Annual Renewal Membership Fee for 2018 - 19

Name of the Members	M.No.	Renewal Period From	To	Total Yrs	Receipt No. & Date	Amount Rs.
6. M.P.Gopalakrishnan	263 TA	20-09-18	19-09-19	28	3806, 26-11-18	1000

Kindly Renew Your Membership Fee well in time !
- Hony. Treasurer

TALK LESS... LISTEN MORE....

An Appeal to Members

We have decided to send invitations of our Technical Lectures / Meetings by e-mail / SMS to all our members. So, please send us your e-mail address and your mobile number to receive the journal and invitations.

All correspondence are to be addressed to:

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Estd. 1981

THE PRINTING TECHNOLOGISTS FORUM (Regd.)
No.2, Venu Reddy Street, Guindy, Chennai - 600 032.

HAPPY NEW YEAR 2019 & HAPPY PONGAL

President and Committee Members wishing all the Members of
THE FORUM, Family Members, Colleagues and their Friends,
A Happy and Prosperous
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with joyful healthy life and career.

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Laminators

MORE THAN
60
MACHINES
SOLD

Automatic Diecutter
with Stripper

MORE THAN
20
MACHINES
SOLD

Offline Stripping and
Blanking machine

MORE THAN
16
MACHINES
SOLD

Automatic High Speed
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MORE THAN
18
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